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E-SYSTEMS
Montek Division

Report No. 131500-616
12 August 1977

LOW PRESSURE ALTITUDE TEST REPORT
FOR THE
AN/TRN-41 TACAN NAVIGATIONAL SET

Prepared for:
Department of the Air Force
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base
Massachusetts 01731

Prepared by:
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18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

AN/TR-41 TACAN NAVIGATIONAL SET

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes the low pressure test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TR-41.

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LOW PRESSURE ALTITUDE TEST REPORT

for the

NAVIGATIONAL SET, TACAN, AN/TRN-41

This report describes the low pressure test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41, 131500-415.

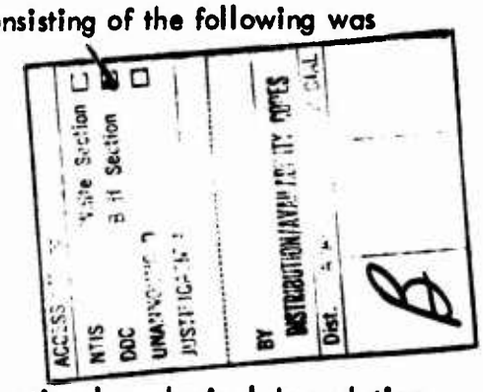
1. Test Identification. Low pressure test as defined in Appendix IV-C (low pressure test procedure) of the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.

2. Functional Purpose of Test. This test forms a part of the AN/TRN-41 system qualification tests.

3. Test Objectives. To demonstrate that the AN/TRN-41 will meet the low pressure requirements of paragraphs 3.2.5.1.3 and 4.2.1.4.3.4 of Specification No. 404L-701-5017A, Part I of 2 parts (20 August 1976).

4. Description of Test Articles. The AN/TRN-41 system consisting of the following was used for the tests:

Receiver-Transmitter	RT-1202/T
Antenna	AS-3132/T
Antenna Support	AB-1237/T
Filter, DC Power	F-1439/T
Interconnecting Cables	



5. Summary of Test Results. The AN/TRN-41 showed no functional or physical degradation during the low pressure test.

6. Description of Test Facilities and Procedures. The test facilities and test procedures are described in Appendix IV-C of the Equipment Test Plan.

7. Test Setup Diagrams. The test setup diagrams are provided in Appendix IV-C of the Equipment Test Plan.

8. Test Equipment. See Attachment 1 for test equipment used for the low pressure test and the pretest, test and post test operational tests.

9. Test Data. Attachment 2 contains the data sheets for the low pressure test and the pretest, test and post test operational tests.

10. Test Conditions. The system was maintained at a pressure equivalent to an altitude of 45,000 feet for 1 hour. The pressure was then increased to an altitude of 13,100 feet and the system operated at that pressure.

11. Test Results Analysis. The system operated normally during the low pressure tests and comparison of test data showed that no degradation of performance occurred during the test. No physical degradation was observed in the visual inspection.

12. Certification. The data sheets shown in Attachment 2 have been signed by a Montek Quality Assurance representative and a DCAS representative, certifying that the test results are authentic, accurate, current and in accordance with the related test plan.

ATTACHMENT 1
TEST EQUIPMENT

TEST EQUIPMENT

Description/Manufacturer	Model	Calibration Due Date
Oscilloscope, Tektronix	465	7/6/77
Signal Generator, RF, H.P.	612A	6/23/77
Peak Power Meter, Boonton	8900B	9/19/77
Pulse Generator, Data Pulse	110B	5/12/77
Counter, Fluke	1953	8/12/77
Half-Ampl. Det. Montek	131500-702	N/A
RF Detector, Montek	135203-100	N/A
Monitor Ant., Montek	006300	N/A
Test Box - Interconnection - Montek	131500-703	N/A
Power Supply HP	6274B	1/16/78
Power Supply Acopian		12/9/77
Power Supply, Sorensen	QR4075A	9/19/77
Directional Coupler 20 dB, Narda	3042B	N/A
Directional Coupler 10 dB, Microlab	CBA-78	N/A
Variable Attenuator, Weinschel 0-10 dB	905	N/A
RF Attenuator, Weinschel	10 dB	N/A
Multimeter, Fluke	8120A	8/2/77
Altitude Chamber, Sperry Univac	-	N/A
Electronic Monometer, Datametric	1023A	10/7/77
Temperature Controller, Honeywell	152P1-92-111-74	10/7/77

ATTACHMENT 2
DATA SHEETS

APPENDIX IV-K

DATA SHEET
ENVIRONMENTAL TEST

TEST Low Pressure (Altitude)

SYSTEM 002

DATE from 9 May 1977
to 9 May 1977

ACCEPTABLE X

NOT ACCEPTABLE

REMARKS The system was subjected to the low pressure (altitude) tests as outlined by test procedure 131500-415, appendix IV-C. At the conclusion of the low pressure test, the system operated normally. There was no degradation in performance based on comparison of test data. No discrepancies were noted.

DISCREPANCIES

SIGN OFF INFORMATION

ENVIRONMENTAL TEST ENGINEER _____ DATE _____

REPRESENTATIVE ENGINEER B D Dayton DATE 5-11-77

QA REPRESENTATIVE M. B. Grant DATE 5-11-77

DCASD OR AF CONCURRENCE [illegible] DATE 5-11-77

June 30, 1976

DATA SHEET

OPERATIONAL TESTS

AN/TRN-41

Test ALTITUDE - (LOW PRESSURE Date 5/8/77

System 003 Time 10:45

Tech

Para. No.	Description	Pre Test 5/8/77 mbz	Test	Post Test	Requirements	Units
6.1	Calibrated RF insertion loss					
	P_L = 31.2 dB	N/A	N/A	N/A	N/A	N/A
	Used in determining RF peak power.					
.2	System turn on normal operation	✓	✓	✓	Check if OK	N/A
.3.1	Antenna radiated signal	✓	✓	✓		
	15 Hz	✓	✓	✓	Check if OK	N/A
	135 Hz	✓	✓	✓	Check if OK	N/A
6.3.2	Antenna Speed	66.667	66.669	66.667	66.667 ± .133	ms
6.4.1.1	Correct identity code	✓	✓	✓	Check if OK	N/A
6.4.1.2	Identity period	37.5	38.0	38.0	37.5 ± 3.75	Seconds
6.4.2	Peak power					
	(1) Reading of peak power meter Pm =	76mw	76 mw	76 mw	N/A	Watts
	(2) Convert to dBm = 10 log Pm x 10^3 = Pm dBm	18.8 dBM	18.81 dBM	18.81 dBM	N/A	dBm
	Total power output in dBm $Pm_{dBm} + P_L$ = *Insertion loss see 6.1 above.	dBM	50.01 dBM	50.01 dBM	50 dBm	dB
6.4.3.3	Pulse count	7184	7182	7187	7200 ± 180	Counts
6.4.4.2	Pulse shape					
	Width (50%)	3.6 ms	3.6 ms	3.6 ms	3.5 ± 0.5	µs
	Rise time (10-90%)	2.2 ms	2.2 ms	2.2 ms	2 ± 0.25	µs
	Fall time (90-10%)	2.5 ms	2.5 ms	2.5 ms	2.5 ± 0.5	µs
6.4.4.4	Pulse spacing	12.0 ms	12.0 ms	12.0 ms	12.0 ± 0.1	µs
6.4.5.2	Delay - 60 ±10 µs 15 Hz trig to first burst pulse.	✓	✓	✓	Check if OK	

DATA SHEET

OPERATIONAL TESTS

AN/TRN-41 (Continued)

No.	Description	Pre Test	Test	Post Test	Requirements	Units
4.4.5.3	Correct north burst - 12 pulse pairs spaced 30 ± 0.1 μs	✓	✓	✓	Check if OK	
4.4.5.5	Delay 50 ± 10 μs - 135 Hz trig to first burst pulse	✓	✓	✓	Check if OK	
4.4.5.6	Correct Aux burst - 6 pulse pairs spaced 24 ± 0.1 μs	✓	✓	✓	Check if OK	
4.4.6.5	RT replies to 3300 interrogations	2627	2562	2508	≥2310 (Counts/Second)	
4.4.6.7	Demand only mode - times to switch from ON to STBY within 70 seconds	✓	✓	✓	Check if OK	✓
4.4.6.8	STBY mode	✓	✓	✓	Check if OK	
4.4.6.9	Demand Only mode - time to switch from STBY to ON ~~≤15~~ 20 sec 4/19/77	✓	✓	✓	Check if OK	
4.4.6.10	ON AIR mode	✓	✓	✓	Check if OK	
4.4.7.1	DME ONLY mode	✓	✓	✓	Check if OK	
4.4.7.2	Switch from DME to TACAN	✓	✓	✓	Check if OK	
4.4.8.1	Antenna Alarm - Within four seconds	✓	✓	✓	Check if OK	
4.4.8.2	Alarm Reset	✓	✓	✓	Check if OK	
4.4.8.3	RT Alarm - Within five seconds	✓	✓	✓	Check if OK	
4.4.8.4	Alarm Reset	✓	✓	✓	Check if OK	

E 3113A

FACILITY: A-1	ENVIRONMENTAL DATA SHEET ENVIRONMENTAL LABORATORY — DEPT. 330	
A.O. 298K-143	ENV. TECH R K Davis	TEST SCHED.
ENGINEER OR Q.C. M. Rogers (E systems)	PHONE 993-9300, X288	TEST COMPLETED
TECHNICIAN	PHONE	TEST REMOVED
UNIT TITLE AN/TRN-41	SER. QTY. 1	TOTAL UTILIZATION

INSTRUCTIONS TO OPERATOR	TEST TO TERMINATE:	BY:	ENVIRONMENTAL LABORATORY SUPERVISORS APPROVAL
TEST Low Pressure SPEC. Mil-std 810 PAR. Method 500.1	1. Test per procedure I A. 3.28 "Hg or 45,900 ft. B. hold for 1 hr. C. 16.20 "Hg or 13,100 ft. D. operate Test Item. E. Return to Ambient pressure.		W. W. Black SIGNATURE DATE

DATE	TIME	CHRONOLOGICAL RECORD OF TEST	INITIALS (PRINT)
5/9/77		Place AN/TRN-41 in Altitude chamber.	DwB
		set pressure to 3.28 "Hg. hold for 1 hr.	
5/9/77		Reset pressure to 16.20" Hg. After stabilization. operated Test ITEM	DwB
5/9/77		Return chamber to ambient pressure.	DwB

VERIFIED & RELEASED BY: _____ Q.C. OR PROGRESS _____ COGNIZANT ENGINEER